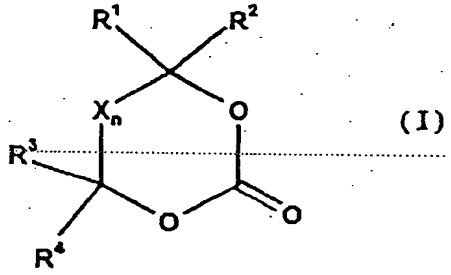
Claims:

1. A process for the hydroformylation of olefinically unsaturated compounds having from 3 to 24 carbon atoms in the presence of at least one metal of groups 8 to 10 of the Periodic Table of the Elements as catalyst, wherein the hydroformylation is carried out in the presence of at least 0.1 mol%, based on the olefinically unsaturated compound, of at least one cyclic carbonic ester of the formula I



(I)

where

R^1, R^2, R^3, R^4 are identical or different and are each H or a substituted or unsubstituted aliphatic, alicyclic, aromatic, aliphatic-alicyclic, aliphatic-aromatic or alicyclic-aromatic hydrocarbon radical having from 1 to 27 carbon atoms,

n is 0 - 5

X is a divalent substituted or unsubstituted, aliphatic, alicyclic, aromatic, aliphatic-alicyclic or aliphatic-aromatic hydrocarbon radical having from 1 to 27 carbon atoms,

and at least one ligand which contains no sulfonic acid group or sulfonate group.

2. The process as claimed in claim 1, wherein R^1, R^2, R^3, R^4 and X are substituted by identical or different substituents selected from among O, N, NH, N-alkyl and N-dialkyl radicals, fluorine, chlorine, bromine, iodine, -OH, -OR, -CN, -C(O)alkyl or -C(O)O-alkyl.

3. The process as claimed in claim 1 or 2, wherein the hydroformylation is carried out in the presence of at least 0.1 mol%, based on the olefinically unsaturated compound, of at least one solvent which is relatively nonpolar compared to the cyclic carbonic ester I and is immiscible with the cyclic carbonic ester I.

4. The process as claimed in claim 3, wherein substituted or unsubstituted hydrocarbons having from 5 to 50 carbon atoms, olefinically unsaturated compounds or olefins having from 3 to 24 carbon atoms are used as nonpolar solvent.

5. The process as claimed in any of claims 1 to 4, wherein the output from the hydroformylation reaction is separated into a fraction comprising predominantly the catalyst and the cyclic carbonic ester and a fraction comprising predominantly the hydroformylation products.

6. The process as claimed in any of claims 1 to 4, wherein the output from the hydroformylation reaction is separated into a fraction comprising predominantly the catalyst and a nonpolar solvent and a fraction comprising predominantly the hydroformylation products and the cyclic carbonic ester.

7. The process as claimed in any of claims 1 to 4, wherein the output from the hydroformylation

reaction is separated into a fraction comprising predominantly the catalyst and unreacted olefinically unsaturated compounds and a fraction comprising predominantly the hydroformylation products and the cyclic carbonic ester.

8. The process as claimed in any of claims 1 to 7, wherein the fraction comprising the catalyst is recirculated to the hydroformylation reaction.

9. The process as claimed in any of claims 1 to 8, wherein the cyclic carbonic ester used is ethylene carbonate, propylene carbonate or butylene carbonate or a mixture thereof.

10. The process as claimed in any of claims 1 to 9, wherein the hydroformylation is carried out in the presence of phosphonites, phosphites, phosphine oxides, phosphines, phosphinites, phosphinines and/or phosphinanes.

11. The process as claimed in any of claims 1 to 10, wherein the unreacted olefinically unsaturated compounds (olefins) are separated off from the reactor output or from the hydroformylation products and are recirculated to the hydroformylation reaction.

12. The process as claimed in any of claims 1 to 10, wherein the unreacted olefinically unsaturated compounds are separated off from the reactor output or from the hydroformylation products and are used in a second reaction stage.